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> Reply Brief

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By
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Due Date: June 19, 2006

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Inventor: Craig A. Finseth, et al.

Serial #: 09/536,101

Filed: March 24, 2000

Title: METHOD AND APPARATUS FOR WATERMARKING RECEIVED TELEVISION CONTENT

Examiner: Hunter B. Lonsberry

Group Art Unit: 2611

Appeal No.: _____

REPLY BRIEF

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 CFR §1.192, Appellants hereby submit the Appellants' Brief on Appeal from the final rejection in the above-identified application, as set forth in the Office Action dated May 5, 2005.

The Applicants believe that no fee is required for filing this Reply Brief. If the Applicants are in error and a fee is required, please charge any additional fees or credit any overpayments to Deposit Account No. 50-0383.

I. STATUS OF CLAIMS

Claims 1-6, 8-14, 16-24, 26-34, and 36-62 are pending in the application.

Claims 19, 20, and 57-59 were rejected under 35 U.S.C. §102(e) as being anticipated in view of U.S. Publication Application No. US 2001/0013097 by Ito et al. (Ito), and these rejections are being appealed.

Claims 1, 2, 9-10, 17, 18, 27-30, 37-40, 44-56, and 60-62 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ito in view of U.S. Patent No. 6,674,858 to Kimura et al. (Kimura), and these rejections are being appealed.

Claims 3, 4, 11, 12, 31, 32, 41 and 42 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ito in view of Kimura and U.S. Publication Application No. US2003/0011684, by Narayanaswami et al. (Narayanaswami), and these rejections are being appealed.

Claims 21 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ito in view of Narayanaswami, and these rejections are being appealed.

Claims 6, 14, 24, and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ito in view of Kimura and in further view of U.S. Patent No. 6,137,952 issued to Hogan (Hogan), and these rejections are being appealed.

Claims 8, 16, 26, and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ito in view of Kimura and further in view of publication 2001/0013124 by Klosterman et al. (Klosterman), and these rejections are being appealed.

Claims 5, 13, 23, 33, and 43 were rejected under 36 U.S.C. § 103(a) as being unpatentable over Ito in view of Kimura , Narayanaswami, and further in view of U.S. Patent No. 6,615,408, issued to Kaiser et al (Kaiser), and these rejections are being appealed.

II. GROUNDS FOR REJECTION TO BE REVIEWED UPON APPEAL

Whether claims 1-6, 8-14, 16-24, 26-34, and 36-62 are pending in the application.

Whether claims 19, 20, and 57-59 were rejected under 35 U.S.C. §102(e) as being anticipated in view of U.S. Publication Application No. US 2001/0013097 by Ito et al. (Ito).

Whether claims 1, 2, 9-10, 17, 18, 27-30, 37-40, 44-56, and 60-62 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ito in view of U.S. Patent No. 6,674,858 to Kimura et al. (Kimura).

Whether claims 3, 4, 11, 12, 31, 32, 41 and 42 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ito in view of Kimura and U.S. Publication Application No. US 2003/0011684, by Narayanaswami et al. (Narayanaswami).

Whether claims 21 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ito in view of Narayanaswami.

Whether claims 5, 13, 23, 33, and 43 were rejected under 36 U.S.C. § 103(a) as being unpatentable over Ito in view of Kimura , Narayanaswami, and further in view of U.S. Patent No. 6,615,408, issued to Kaiser et al (Kaiser).

Whether claims 6, 14, 24, and 34 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ito in view of Kimura and in further view of U.S. Patent No. 6,137,952 issued to Hogan (Hogan).

Whether claims 8, 16, 26, and 36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ito in view of Kimura and further in view of publication 2001/0013124 by Klosterman et al. (Klosterman).

III. ARGUMENT

A. With Respect to Claims 19 and 20

In response to the Applicant's Appeal Brief, the Examiner answers as follows:

"Regarding Appellant's argument, the Examiner disagrees. As admitted by Appellant, Ito clearly inserts ID data into the pixels, which make up a frame of video data (paragraphs 43-44). Examiner asserts that Ito clearly shows imprinting multiple copies of the ID on the image."

The Examiner continues:

"Ito shows imprinting the ID in the LSB of the luminance value of *each* pixel (page 3 section 0044, imprinting ID on the luminance value of multiple pixels)."

This is almost correct. Ito's ID comprises a plurality of bits.[1] The ID is added to the frame by modifying the least significant bit of each pixel in a frame with a corresponding bit of the ID. The Examiner continues:

"Since multiple pixels will be imprinted with the ID, multiple copies are used."

This is where the Examiner's rejection goes seriously awry. Ito discloses a system in which ID information from different users (e.g. A, B, and C in FIG. 6 below) is represented by a point in a two-dimensional frequency domain. (See paragraph [0042]).

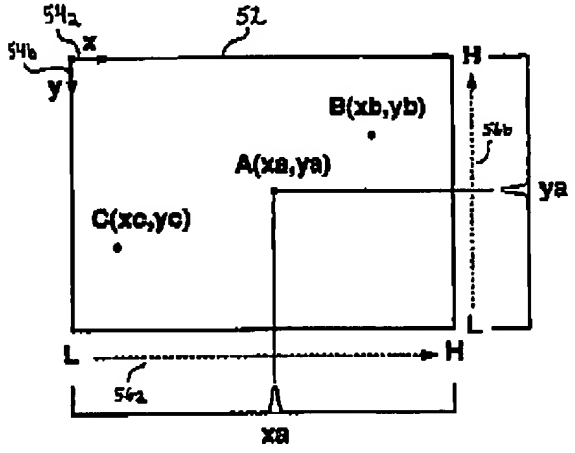

Fig. 6

[1] If the ID were a single bit, it would be difficult to function as an identifier.

The ID information is IFFTd (inverse Fast Fourier Transformed) to create a bit pattern in the space domain. An example is shown in FIG. 7 below, wherein the bit pattern shows a value of "1" for the shaded areas and a value of "0" for the unshaded areas.[2] Note that the bit pattern covers the entire frame.

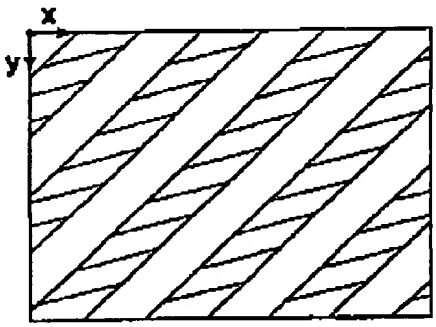

Fig. 7

The bit pattern of ones and zeros, once converted back to the frequency domain (presumably by an FFT) would reproduce the result shown in FIG. 6 for the ID of user "A". The bit information is imprinted by replacing the least significant bit (LSB) of the luminance value of *each pixel* by the value of the corresponding value of the bit pattern containing the ID information (such as shown in FIG. 7). Thus, a single value for the ID, which comprises multiple bits filling the entire frame, is inserted by changing the least significant bits of the luminance values. That, however, is not the same thing as "modifying a frame of the data representing the program content to include multiple copies of receiver identification data. As recited in paragraph [0044] of the Ito reference, *an* ID is imprinted over the entire image, not *multiple copies* of the ID.

> Thus, in this embodiment, an ID is imprinted over the entire image or an extended portion thereof. This method is advantageous as a countermeasure against partial cutoff in the content, as the extended portion over which the ID is imprinted may be chosen such that the cut off of which would substantially impair the usefulness of the content.

The Examiner continues:

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[2] Note that user's ID represented by a signal at a higher frequency (e.g. "B" in FIG. 6) would result in a pattern with the ones and the zeroes (hence the shaded and unshaded areas in the time domain) spaced closer together.

> Furthermore, Ito shows that the ID is imprinted over the entire image (page 3, section 0044). This is to protect against partial cut-off of the content (page 3 section 0044). This clearly indicates that multiple copies are used in multiple pixels in the case that some of the pixels that have the data are not received properly.

As described above, this is not correct. The Examiner continues:

> The system can choose[s] from several pixels to choose the ID so that it will always have a source of the ID. If only one single ID data was spread over the entire image, this would then preclude the system from retrieving the correct ID if an error occurred. (emphasis in original).

Again, this is not correct. The system spreads the single ID (which comprises multiple bits) throughout the entire frame or an extended portion of it. There is no teaching whatsoever of inserting multiple copies of the same ID.

The Examiner continues:

> "Furthermore, Ito also shows inserting the ID into multiple groups. Ito shows imprinting the ID data into groups of 3x3 pixels (page 3 section 0050, imprinting the ID on groups of 3x3 pixels). Similar to the above, these groups of ID pixels are added to the "luminance data as a whole, so that the whole data ... contain the ID. This establishes that the multiple IDs are spread throughout the entire image data in groups of 3x3 pixels, and not the entire frame contains a single copy of the ID. This, like above is to ensure that if a particular section of pixels is not received, or cut-off, the ID may still be received as disclosed in paragraph 44."

Respectfully, the Examiner is misreading the Ito reference. The omitted portion of the above quote is highlighted in the reproduction of paragraph [0050] below:

> [0050] FIG. 13 shows an example of a 3x3 pixel area in a content such as an image, where the luminance of the respective pixels are "10, 8, 0 . . . " as shown. FIG. 14 is a diagram showing the luminance of the same 3x3 pixel area in the image, but expressed using modulo 3 arithmetic. Using this arithmetic, the corresponding value of a pixel whose luminance is 10, for instance, becomes 1. FIG. 15 is a diagram showing a sample data pattern representing ID information, generated using methods described earlier, to be imprinted into the 3x3 pixel area of the image shown in FIG. 14. The ID pattern is also expressed in modulo 3 arithmetic. In this example, 0's, 1's, and 2's are to be imprinted into the first, second, and third rows of pixels, respectively. FIG. 16 is a diagram showing the state in which an offset of -1, 0, or 1 is added to each pixel value of the 3x3 pixel area shown in FIG. 14 to obtain the corresponding pixel value of the 3x3 pixel area shown in FIG. 15. In operation, the ID information is imprinted into the 3x3 pixel area of the image shown in FIG. 13 by adding to each pixel an offset value -1, 0 or 1 according to the calculation shown in FIG. 16. According to this method, an offset is added to the luminance data as a whole, so that the whole data, ***including the upper bits***, contain the ID.

This paragraph must be read in context of the paragraph that comes before it. Paragraph [0050] presents an embodiment in which an offset is given to a lower bit so that all bits of the luminance data is changed (and not just the LSBs):

> [0049] Fourth, although an ID is imprinted into a lower bit irrespective of upper bits in the aforementioned embodiment, an offset may be given to a lower bit such that the whole data including upper bits contains the ID.

With that in mind, paragraph [0050] merely provides a specific example of how one can add the ID to a frame by using an offset instead of simply modifying the LSB. It does so by focusing on a 3x3 area of the frame. FIG. 13 shows the luminance data:

10	8	0
20	30	7
16	12	100

Fig. 13

FIG. 14 shows the same information in Modulo 3 arithmetic.

1	2	0
2	0	1
1	0	1

Fig. 14

FIG. 15 shows the ID *information* to be added to the 3x3 area of the frame (note, Ito is careful to say that the what is added is not the whole "ID," but rather "ID information." That is because it does not represent the entire ID, which takes up a frame of information, as shown in FIG. 7. In Ito's words:

> FIG. 15 is a diagram showing a sample data pattern representing ID information, generated using methods described earlier, to be imprinted into the 3x3 pixel area of the image shown in FIG. 14.

0	0	0
1	1	1
2	2	2

Fig. 15

In operation, the ID information is imprinted into the 3x3 pixel area of the image shown in FIG. 13 by adding to each pixel an offset value -1, 0 or 1 according to the calculation shown in FIG. 16. According to this method, an offset is added to the luminance data as a whole, so that the whole data, including the upper bits, contain the ID.

1-1	2+1	0+0
2-1	0+1	1+0
1+1	0-1	1+1

Fig. 16

In quoting the foregoing passage of the Ito reference,

"Similar to the above, these groups of ID pixels are added to the "luminance data as a whole, so that the whole data ... contain the ID. This establishes that the multiple IDs are spread throughout the entire image data in groups of 3x3 pixels, and not the entire frame contains a single copy of the ID."

the Examiner omitted a crucial phrase of the Ito reference. The entire sentence reads:

According to this method, an offset is added to the luminance data as a whole, so that the whole data, including the upper bits, contain the ID.

Clearly, the statement that the ID information is added "to the luminance data as a whole" refers to the fact that the data is not simply substituted for the LSBs of the luminance data ... instead, an offset is added to the full (presumably 8) bits of luminance data. Consequently, this portion of Ito does not establish "that the multiple IDs are spread throughout the entire image data in groups of 3x3 pixels, and not the entire frame contains a single copy of the ID" as the Examiner argues.

B. With Respect to Claims 57-59

The Examiner's Answer rejects claim 57 for the same reason as claim 19. The Applicants disagree for the reasons described above.

C. With Respect to Claims 1, 9, and 27

In their appeal brief, the Applicants pointed out that (1) Ito does not disclose inserting multiple copies of the ID into a single frame, and that (2) Ito teaches away from the Applicants' invention because it teaches spreading the ID among a plurality of frames.

The Examiner's answer does not dispute that Ito teaches spreading the ID among a plurality of frames, but points out that Ito does not teach that such spreading is required.

The Applicants do not disagree. Ito does teach spreading an ID among a plurality of frames in the alternative. But the fact remains that Ito (1) does not teach inserting multiple copies of the same ID in a single frame, and does (2) teach spreading a single ID over several frames.

"A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, *or would be led in a direction divergent from the path that was taken by the applicant. In re Gurley*, 27 F.3d 551, 553, 31 U.S.P.Q.2d 1130 (Fed. Cir. 1994) (emphasis added). Ito teaches away from the Applicants' invention because it does precisely that.

D. With Respect to Claims 17, 18 and 37

The Examiner's answer rejects claims 17, 18, and 37 for the same reasons as claim 19. The Applicants disagree for the reasons described above.

IV. CONCLUSION

In light of the above arguments, Appellants respectfully submit that the cited references do not anticipate nor render obvious the claimed invention. More specifically, Appellants' claims recite novel physical features that patentably distinguish over any and all references under 35 U.S.C. §§ 102 and 103. As a result, a decision by the Board of Patent Appeals and Interferences reversing the Examiner and directing allowance of the pending claims in the subject application is respectfully solicited.

Respectfully submitted,

Date: June 13, 2006

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